

# Net gains for Thames Valley

Thanks to 'Video over IP' technology, Thames Valley Police can now receive live images from local authority CCTV control rooms. **Lawrence Cohen** reports on a project which has enhanced the force's ability to respond to incidents.

Thames Valley Police (TVP), which has long been one of the UK's most forward-thinking police forces when it comes to CCTV, has developed a video transmission system which will transform the force's ability to view images from Thames Valley's public surveillance cameras.

Thanks to CEDRIC, an innovative 'Video over IP' (Internet Protocols) system, TVP is now able to route any of the 1,100 video images taken from the region's 11 public CCTV control rooms (which cover 25 cities, towns and villages) to the force's two new central control rooms at Abingdon and Milton Keynes, via a secure Wide Area Network (WAN).

David Chalice, IT network manager at TVP, hails his force's use of Video over IP to transmit public CCTV images back to its control rooms as ground-breaking: "We have come up with a system that allows us to enter the world of IP and is much more advanced than anything else being used by any other UK police force," he says.

## Incident response

If the police wish to monitor either an incident, or an area where they suspect an incident is about to occur, they can contact their relevant local authority CCTV control room and request for footage from cameras nearest to the area concerned to be transmitted to either of the force's control rooms. The images will then appear on police operators' computer monitors. The operators can select views from different cameras using touchscreen, or by clicking the computer mouse.

Instant access to live images from public CCTV cameras has made it easier for Thames Valley Police control room operators and incident managers to assess an incident as it unfolds and direct the police response accordingly via the force's radio network. By viewing images in real-time, operators can give police officers on the ground a better idea of what to expect when they arrive at the scene of an incident.

TVP's access to local authority CCTV images does not end there. Because Video over IP transmission is wireless, the force's senior police officers, whatever their location, can view video footage of developing incidents via a laptop or desktop PC. Derek Maltby, principal of MSC Security Consultancy, contracted by TVP to develop the Video over IP system, says: "You could have several senior officers in different locations looking at the same video image, which would enable the



All eyes on CEDRIC: TVP's David Chalice shows his project partners how Video over IP can be viewed from Abingdon police control room

officers to make a more informed decision on what the appropriate response to an incident should be. Video images could even be sent to a chief police officer up in Scotland."

The images transmitted via the CEDRIC system, whether it is to a police command and control centre or a chief constable's desk, are crystal clear, says TVP's David Chalice. The early days of Video over IP are commonly associated with poor quality images and low frame rates, but TVP's CEDRIC system shows that the technology has come on leaps and bounds over the last couple of years. "The video pictures we receive over IP are of incredible high quality," he says. "There is no pixelation and we are amazed at how clear the images are."

## IP versus ISDN

Three companies have worked together to develop the Video over IP system for TVP: MSC Security Consultancy (which had already carried out CCTV design and project management for a number of local councils in the Thames Valley region), Computer Networks Ltd (CNL) and Lambert & Associates, a CCTV consultancy.

Thames Valley Police and MSC had initially

planned to transmit public CCTV images to its police control rooms via ISDN, but found Video over IP to be a less expensive, more flexible transmission option. Both parties also decided that as TVP was in the process of upgrading its force-wide Local Area Network (LAN), it would be relatively easy to piggy-back Video over IP onto the upgraded network.

MSC's Derek Maltby – well-known to the CCTV User Group as a member of its Standards Advisory Board – recalls: "Originally, the project was budgeted at £250,000 with ISDN, but we managed to halve the cost of the project by using Video over IP, which is so flexible compared to ISDN and has far greater long-term potential." Following the successful implementation of CEDRIC, TVP is planning to integrate video from helicopter cameras and motorway monitoring units, as well as use video to monitor and manage access control points.

Simon Lambert, principal at Lambert & Associates, specified the new Video over IP system for TVP and MSC and found it a tough challenge finding a company that could provide a suitable IP system. "We met several died-in-the-wool CCTV companies at

IFSEC but drew a total blank when we told them what we wanted to do with Video over IP for Thames Valley Police,” says Simon. “We decided that we did not need these traditional security companies to help us and so we looked for an IT company which was not scared by IP but was also familiar with security applications.”

The search ended with Computer Network Limited (CNL), winner of ‘Best Software’ Product and the overall Innovation award at the IP Security Awards earlier this year for its IPVideoCenter. CNL describes itself as a specialist in integrating hybrid systems, and it adapted its existing IPVideoCenter Software (IPVC) to meet TVP’s needs. The software uses an advanced Microsoft .Net infrastructure to ensure that TVP’s IP system has unlimited potential for expansion involving any additional IP-attached devices.

## Low bandwidth

CNL has managed to keep transmission costs down by transmitting images via CEDRIC over just half a megabyte of broadband, which is pretty much the same amount as a standard domestic broadband internet connection: “The colour quality of the images being transmitted to TVP’s control room is exceptional and does not suffer in any way by us using just half a megabyte of bandwidth,” says Keith Bloodworth, CNL managing director. CNL’s IPVideoCenter Software controls the use of the available bandwidth.

CNL has also taken steps to ensure that video images sent from public CCTV control rooms to TVP over the internet are transmitted securely to prevent unauthorised persons from being able to access the images. “Operators at each end of the transmission get confirmation that they have sent and received a data packet,” says Keith. “For additional security, the system uses 128-bit encryption, commonly used for credit card transactions over the internet.”

## Data protection

Even operators viewing the images at TVP’s central control rooms do not have the facility to call up video footage from public CCTV cameras without obtaining permission from the relevant local authority first. In order to comply with the Data Protection Act, control over the CCTV images is retained by local public CCTV scheme managers. MSC’s Derek Maltby says: “Thames Valley Police cannot just pull up the pictures – local councils have got to be happy to allow the police access to any images and be convinced that the images will be used for the right reasons.”

Police operators have to contact local authority CCTV operators who can then select the appropriate images and transmit them to the police control room simply by switching

the button on the CEDRIC box located on their desk to the ‘on’ position. Once the incident that the police control room wanted to monitor has ended, public CCTV control room staff can stop the images transmitted by switching the CEDRIC box button back to the ‘off’ position.

The police cannot control the cameras either – panning, tilting and zooming is left to operators in the local authority CCTV control room. A full audit trail is provided to show that TVP staff have viewed live footage from public surveillance cameras.

TVP requests to view public video images have had hardly any impact on the workload of local authority CCTV control room operators, says Mike Batchelor, CCTV Manager for Vale of White Horse District Council. “It has made no difference to our operation because all our operators have to do is flick a switch,” says Mike.

David Chalice of Thames Valley Police reckons that now his force has shown how Video over IP can be used to gain greater access to public CCTV images, other UK police forces will eventually follow suit. He reveals: “The Association of Chief Police Officers (ACPO) officer in charge of control rooms is very pleased with our system and is looking to encourage use of Video over IP elsewhere within the police service.”

Video over IP, it seems, has finally arrived in the public sector and the partnership between police and local authority CCTV schemes looks set to benefit as a result.

Top pic: A TVP operator at Abingdon monitors pictures transmitted from a local authority CCTV control room.

Second and third pics down: Live images transmitted from public CCTV schemes have helped TVP operators to co-ordinate incident response.

Bottom pic: CEDRIC equipment takes up little space in a local authority control room



# All aboard the IP train

As Thames Valley Police has shown, it is now possible to transmit crystal clear video images over the internet. Convincing the IT department of your company or local authority to allow CCTV onto its IP network, however, can still be an uphill battle.

“Even today, IT managers are often resistant to allowing CCTV onto their computer network,” says Gary James, technical sales manager at distributed video specialist Visimetrix. “IT managers are concerned that CCTV is going to hog bandwidth and slow down their organisation’s IT network.”

Andover Controls, another Video over IP provider, uses “bandwidth throttling” to prevent CCTV systems from hogging an organisation’s IP network. “Our DVX digital recorders have got a bandwidth throttling algorithm built into them to control their impact on the IP network,” says Paul Fileman, sales and marketing manager for Andover Controls. “You tell each unit the maximum bandwidth it can occupy across a network. IT managers love it.”

Soon, however, there will be less need to throttle bandwidth as there will be more bandwidth to go round, predicts Visimetrix’ Gary James. “There are lots of bandwidth expansion technologies coming along, such as gigabit and ADSL, which will enable a lot of growth in the use of Video over IP,” he says.

Although most town and city centre CCTV schemes still use cable for transmission, several schemes have embraced Video over

IP to expand existing systems. Gary says: “Recent improvements in wireless Ethernet technology have proved a tremendous boon to people who just want add in one or two cameras inexpensively,” he says.

UK distributed video manufacturers have recognised that CCTV users might want to use digital technology in tandem with older, analogue equipment. Dedicated Micros’ new DV-IP Network Video Server digitises and records video from multiple analogue cameras while being able to simultaneously transmit digital video over a standard computer IP network.

With the ability to monitor cameras remotely from anywhere using Video over IP, “you’ve basically got a means by which you can shift your control room around to wherever you want it to be,” says Pauline Norstrom, marketing manager for Dedicated Micros.

Meanwhile, more and more security end-users are switching from analogue to digital networked recording. Fast food chain McDonald’s has replaced VCRs with Dallmeier’s S1 Digital Hard Drive Recorder at its UK restaurants; senior management can view recorded footage of store activity on a networked PC via a secure public network. EP Smith, technical manager for Dallmeier UK, says: “By networking video over an IP network, we are cutting the enormous cost of cabling and moving the monitoring equipment out of the control room.”

## Distributed video recording - is it the new paradigm for CCTV over IP?

By Graham Porter, Integral Development Manager, Andover Controls

Until recently, CCTV operators have used dedicated systems for the communication of CCTV data. These typically require their own communication links between cameras and monitors in the form of coaxial cabling or microwave transmitters.

However, organisations are now attaching additional services to their common networking infrastructure to cut down on the number of disparate circuits they have running throughout their premises.

This growing trend of using the IP infrastructure to carry more than just IT services has opened up many opportunities, including the ability to transmit video data.

Therefore, it is now possible for CCTV images to be carried over existing IT networks. This is achieved via the use of IP cameras, which have their own network address, or via cameras that are connected to modules, which digitise images and give that camera a network address.

This allows images to be accessed by any PC on the same network as the cameras or via an Internet connection. It also, potentially, removes the need for large and expensive CCTV control rooms, making it possible for CCTV monitoring to be outsourced.

More recently, however, end users have been using distributed video recorders to allow CCTV images to be accessed over networks.

These distributed recorders are placed in the locality of the area being monitored and are networked with a number of other recorders, which take images from other sites also needing to be monitored. The result is a network of locally based units that hold images from their localities.

The major advantage of having a distributed digital video recording solution is that all the extensive recording and search tools of the DVR

can be accessed locally - directly from the DVR - as well as remotely with client software.

By having distributed digital video recorders, end users are not relying on one remote recording unit to hold video data from all their different geographical sites. It is evenly distributed over the entire network of recorders. This is a classic example of not keeping all of your eggs in one basket!

By distributing video recorders across several sites - across a chain of convenience stores for example - live, recorded and archived CCTV images can be viewed and managed on a site by site basis, as well as remotely.

For instance, if there are 10 retail stores across a county or a city, each store will have its own DVR, which records images from cameras at that store. These recorders provide a local hub, which can then be accessed, reconfigured, administered, searched or viewed locally or remotely - from a head office, for example.

This gives the advantage of having total control of the CCTV system at a local level as well as from a remote access point. The system’s integrity can be maintained by limiting access to certain functions and administrative tools for different users.

The Integral range of DVRs from Andover Controls is perfectly suited to distributed video recording. The DVR takes images from any number of cameras and allows access to them from one point.

End users don’t need to physically connect to Integral to use its powerful features. With Andover’s client software - RemoteView - on a PC or laptop, authorised users can operate all Integral systems from any location with a network or Internet connection. The RemoteView client software is included at no additional cost with every Integral system.